Does Radiation Therapy Contribute to Breast Cancer-Related Lymphedema After Axillary Node Dissection and Simplified Lymphatic Microsurgical Preventive Healing Approach (S-LYMPHA)

H. Kadar Sfarad[1], M. Freret[2], A. E. Balari[1], C. Padilla[3], J.V Janin[4], A. Desai[1], E. Avisar[1]

[1] Division of Surgical Oncology, University of Miami, [2] Division of Radiation Oncology, University of Miami, [3] Division of Radiation Oncology, Universidad del Norte, [4] Miller School of Medicine, University of Miami

Introduction

Incidence of breast cancer-related lymphedema (BCRL):

- Ranges from 15-40% after axillary node dissection (ALND)

Bioimpedance spectroscopy (BIS):

- Objective measure of lymphedema (LE)
- Generates an L-Dex Score
- Ability to detect subclinical lymphedema (SLE)

Risk factors for BCRL are:

- Obesity, radiation therapy, wound complication, older age

S-LYMPHA is a preventive surgical procedure performed by Breast surgical oncology during ALND to minimize the risk of BCRL



Aim

To evaluate the impact of various clinical and radiation therapy parameters, including radiation doses, fields, and techniques, on the development of BCRL in patients after ALND and S-LYMPHA.

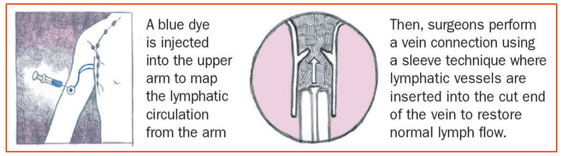
Methods and Materials

- Retrospective review of patient who underwent ALND and SLYMPHA from 2014-2023
- Demographics, clinical, surgical, pathological and radiation data were recorded for all patients
- L-DEX measurements pre-operatively and at 6, 9, 12, 24 months and clinical presence of LE was also documented
- Binomial logistic regression models for statistical analysis

Results

Study Cohort & Lymphedema Assessment:

- Total cohort: 219 patients
- Lymphedema assessments using SOZO bioimpedance spectroscopy: 136 patients
- BCRL (Bioimpedance score >10) detected in 33 patients (15%)
- BCRL detected in physical examination: 45 patients



Limitations

- Retrospective study design
- Limited sample size for L-Dex data
- Lack of statistically significance results

Conclusions

- In this unique patient population, **adjuvant radiation therapy is associated with increased odds ratio of developing BCRL, particularly when delivered using 3DCRT or IMRT/VMAT techniques**
- Risk is further elevated in patients who are older, have **higher BMI, recurrent disease, undergo reconstructive surgery and have N2/N3 nodal involvement**

Univariate analysis of factors associated with BCRL	BCRL based on LDEX		BCRL based on Clinical Exam	
	Odds Ratio	P-Value	Odds Ratio	P-Value
Patient Demographics				
Age on date of surgery	1.038	0.019	1.019	0.169
BMI on date of surgery	1.014	0.652	1.027	0.324
Recurrence	1.448	0.555	1.341	0.611
Received neoadjuvant treatment	0.610	0.239	0.703	0.342
Underwent reconstructive surgery	1.230	0.653	0.890	0.771
Pathological Node Staging				
N1 compared to N0	1.094	0.898	0.865	0.801
N2 compared to N0	2.143	0.308	1.273	0.709
N3 compared to N0	2.187	0.314	1.647	0.447
Radiation Factors				
Received adjuvant radiation	1.484	0.556	2.739	0.122
Received sequential boost	0.896	0.804	0.814	0.585
Elapsed days of primary radiation	0.992	0.788	0.989	0.675
Primary Radiation Technique				
No adjuvant radiation (reference group)				
IMRT/VMAT	2.031	0.385	4.304	0.064
3DCRT	2.368	0.294	3.951	0.085
IMPT	1.875	0.641	2.250	0.546
Radiated Areas				
No adjuvant radiation (reference group)				
Comprehensive radiation	1.092	.902	2.692	0.149
Comprehensive excluding dissected axilla	1.640	.488	2.982	0.110
Chest wall only	2.333	.373	1.308	0.765

Contact

Dr. Hadas Kadar Sfarad
University of Miami/Jackson Medical Center
Email: hxk624@miami.edu
Phone:3054646828

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